

## CLAIMS

- ①. A vertical furnace comprising:  
a reaction pipe located in a heating furnace;  
a means for feeding reaction gas into the reaction pipe; and

a means of holding a wafer in the reaction pipe;

wherein the wafer has {001} as a main principal plane and is heated in a condition in which the wafer is prevented from making contact with the holding means in crystal orientations  $\langle 100 \rangle$ ,  $\langle 010 \rangle$ ,  $\langle -100 \rangle$  and  $\langle 0-10 \rangle$ .

2. A vertical furnace as set forth in claim 1, wherein the reaction tube has a double structure composed of an outer tube and an inner tube, and the wafer is adapted to be located in the inner tube.

- ③. A heat treat method wherein a wafer having {001} as a principal plane is heat treated in such a condition that the wafer is not supported in crystal orientations  $\langle 100 \rangle$ ,  $\langle 010 \rangle$ ,  $\langle -100 \rangle$  and  $\langle 0-10 \rangle$ .

- ④. A heat treat method wherein a wafer having {001} as a principal plane is heat treated after the wafer is supported at desired positions other than crystal orientations  $\langle 100 \rangle$ ,  $\langle 010 \rangle$ ,  $\langle -100 \rangle$  and  $\langle 0-10 \rangle$ .

- ⑤. A wafer boat for a vertical furnace, comprising a plurality of vertically arranged support columns, and support members for wafers, supported to the support columns at predetermined pitches in the

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vertical direction, the support members supporting the wafers so as to be made into surface contact with the peripheral edge parts of the wafers, characterized in that groove-like cutouts for preventing the support member from making contact with the wafers are formed in the support members in surfaces on the side where the support members support the wafers, at positions making angle of 45 deg. with respect to an inserting direction of the wafers at the center of an arc or a ring of each of the support members.

6. A wafer boat for a vertical furnace as set forth in claim 5, characterized in that the support members are not provided in a range from an angle of +45 deg. to an angle of -45 deg. with respect to the inserting direction of the wafer.

7. A wafer boat for a vertical furnace as set forth in claim 5, characterized in that a curvature is formed in an end part of each of the groove-like cutouts.

⑧. A wafer boat for a vertical furnace, comprising a plurality of vertically arranged support columns, and support members for wafers, supported to the support columns at predetermined pitches in the vertical direction, the support members supporting the wafers so as to be made into surface contact with the peripheral edge parts of the wafers, characterized in that the support members are formed therein with groove-like cutouts for preventing themselves from

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making contact with the wafers each having {001} as a principal plane crystal, in crystal orientations  $\langle 100 \rangle$ ,  $\langle -100 \rangle$ ,  $\langle 010 \rangle$  and  $\langle 0-10 \rangle$ .

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